Seminar Robot Perception WS14/15

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AiS Autonomous Intelligent Systems

What is robot perception?

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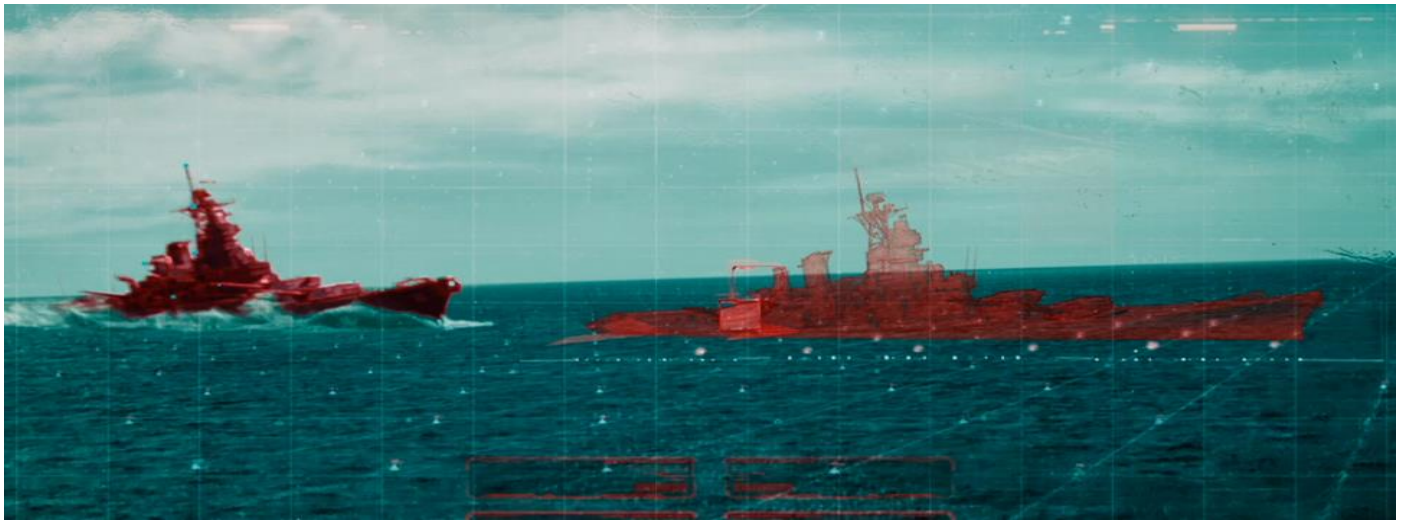


More seriously…

- Process and reason on sensory data for robotic applications
- Camera
- 2D/3D Range data (laser)

What will you learn?

- Read top-notch scientific papers
- Do literature research
- Give a presentation
- Discuss a research problem

What will you have to do?

- Read all the papers
  - Answer questions for each one (summary)
- Select a paper:
  - Understand it, do literature research
  - Present it to the class
- Take part in the discussion
  - Ask relevant questions

Summary of each paper

- Several questions for each paper
- Expected: compact answers
- Overall not bigger than 6 pages

- **Needs to be sent to the supervisor before the presentation**

Your paper

- Read it
- Understand it
- Read relevant papers related to it

- Preliminary presentation
- Final version of the presentation

Your paper – presentation

- Keep it simple but not too simple!

- Example outline:
  - Motivation
  - Background
  - Approach
  - Results
  - Conclusions

Your paper – presentation

- Use images/videos
- Understand or skip
- Check the time
- PRACTICE
- Check guide on the website

- **Meet with advisor before presentation**

Scoring criteria

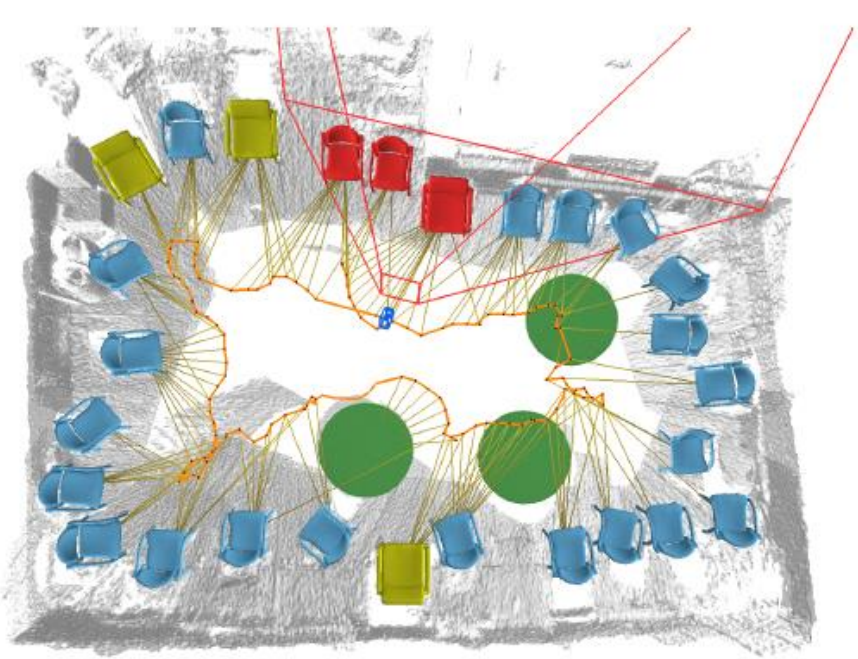
- Presentation: 60%
- Summary: 30%
- Participation in the discussion: 10%

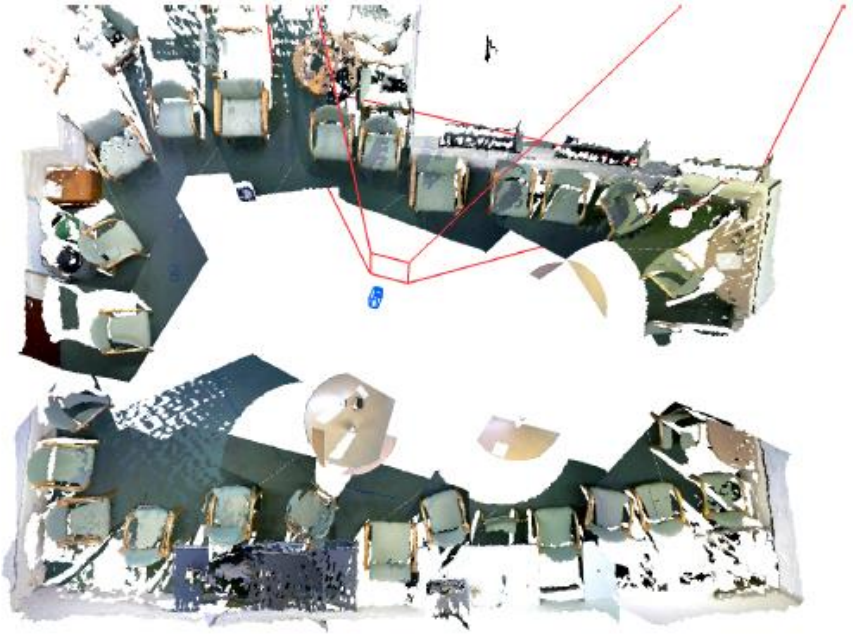
Dates

1st ver. presentation	4.Feb.2012
1st ver. summary	6.Feb.2012
final summary	14.Feb.2012
presentation	18.Feb.2012

Papers

Mapping at Object Level

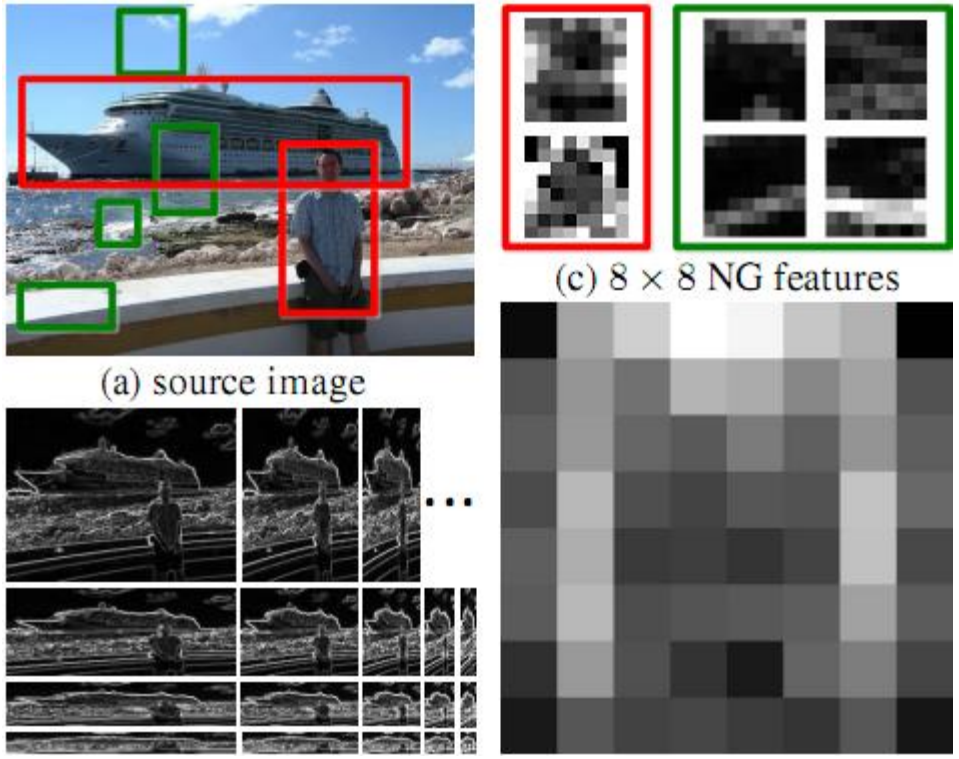




"SLAM++: Simultaneous Localisation and Mapping at the Level of Objects"

Salas-Moreno et al – CVPR13

Objectness Estimation



"BING: Binarized Normed Gradients for Objectness Estimation"

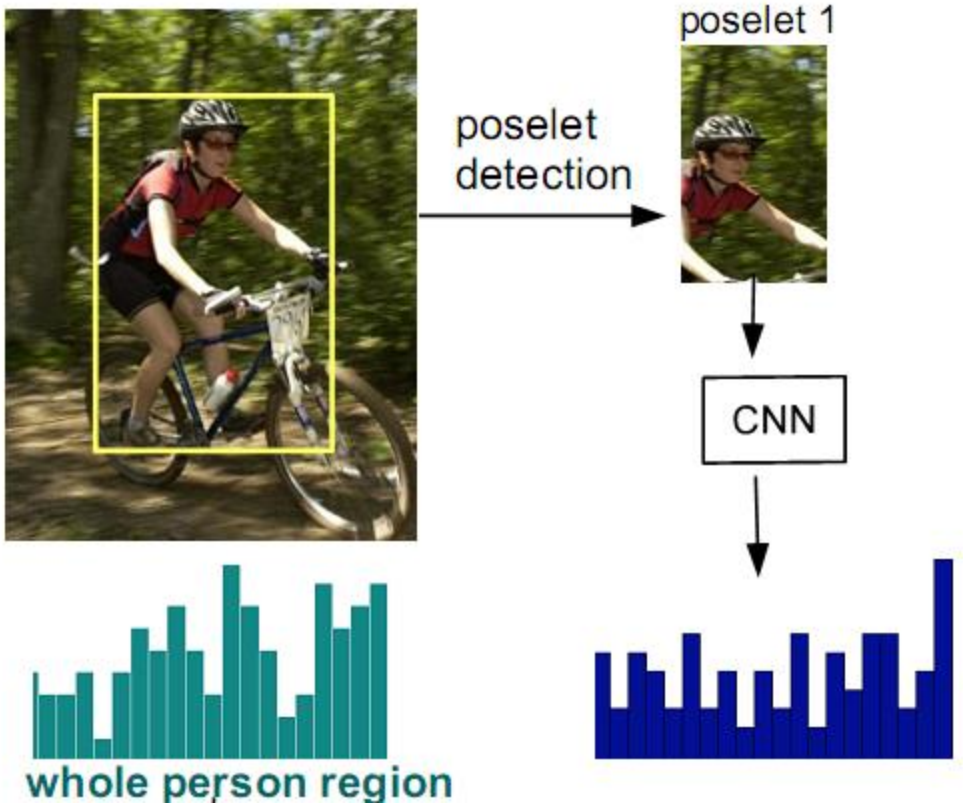
Cheng et al – CVPR14

2D to 3D matching

"Seeing 3D chairs: exemplar part-based 2D-3D alignment using a large dataset of CAD models"

Aubry et al – CVPR14

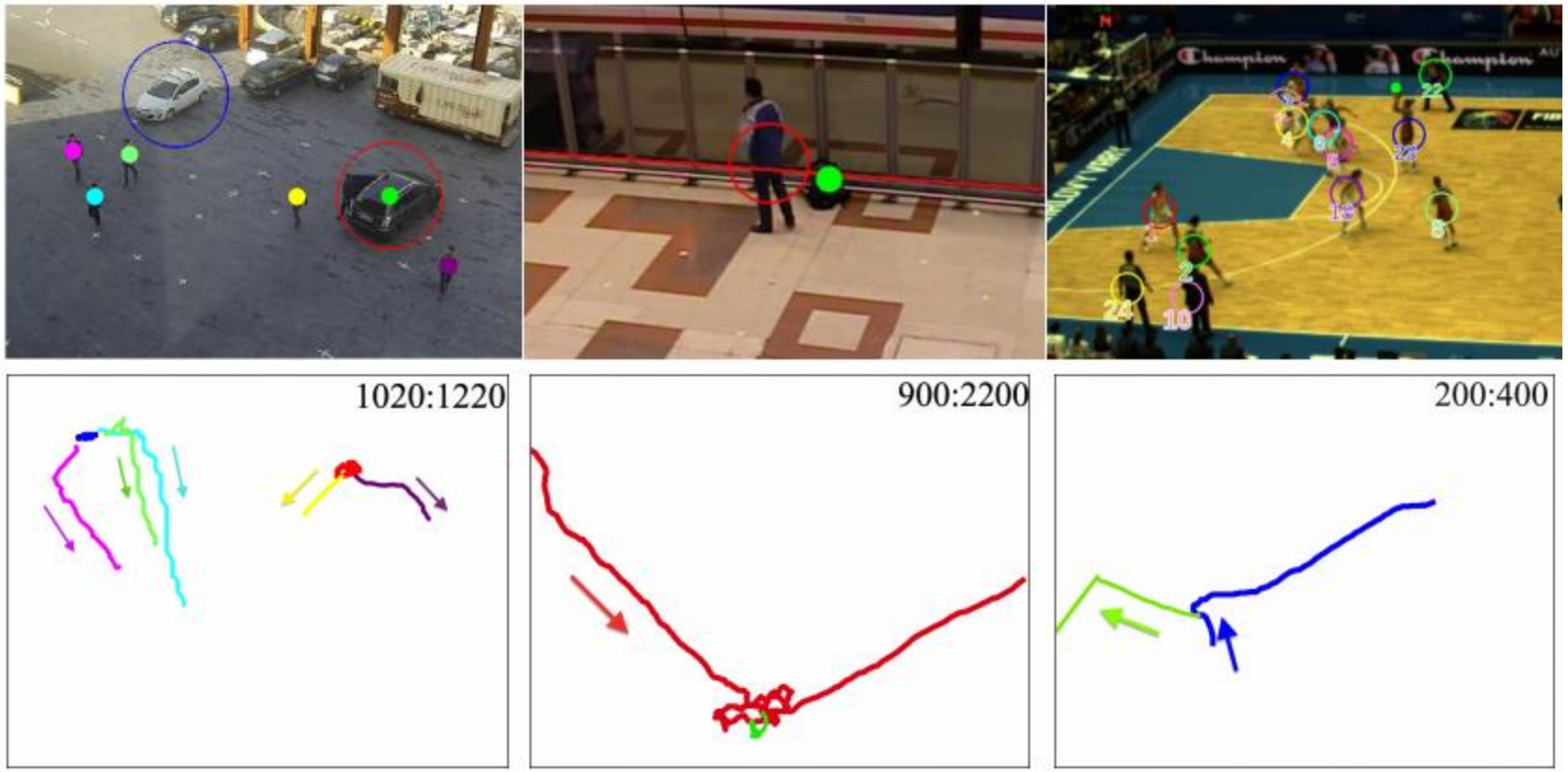
Deep Attribute Learnining



"PANDA: Pose Aligned Networks for Deep Attribute Modeling"

Zhang et al – CVPR14

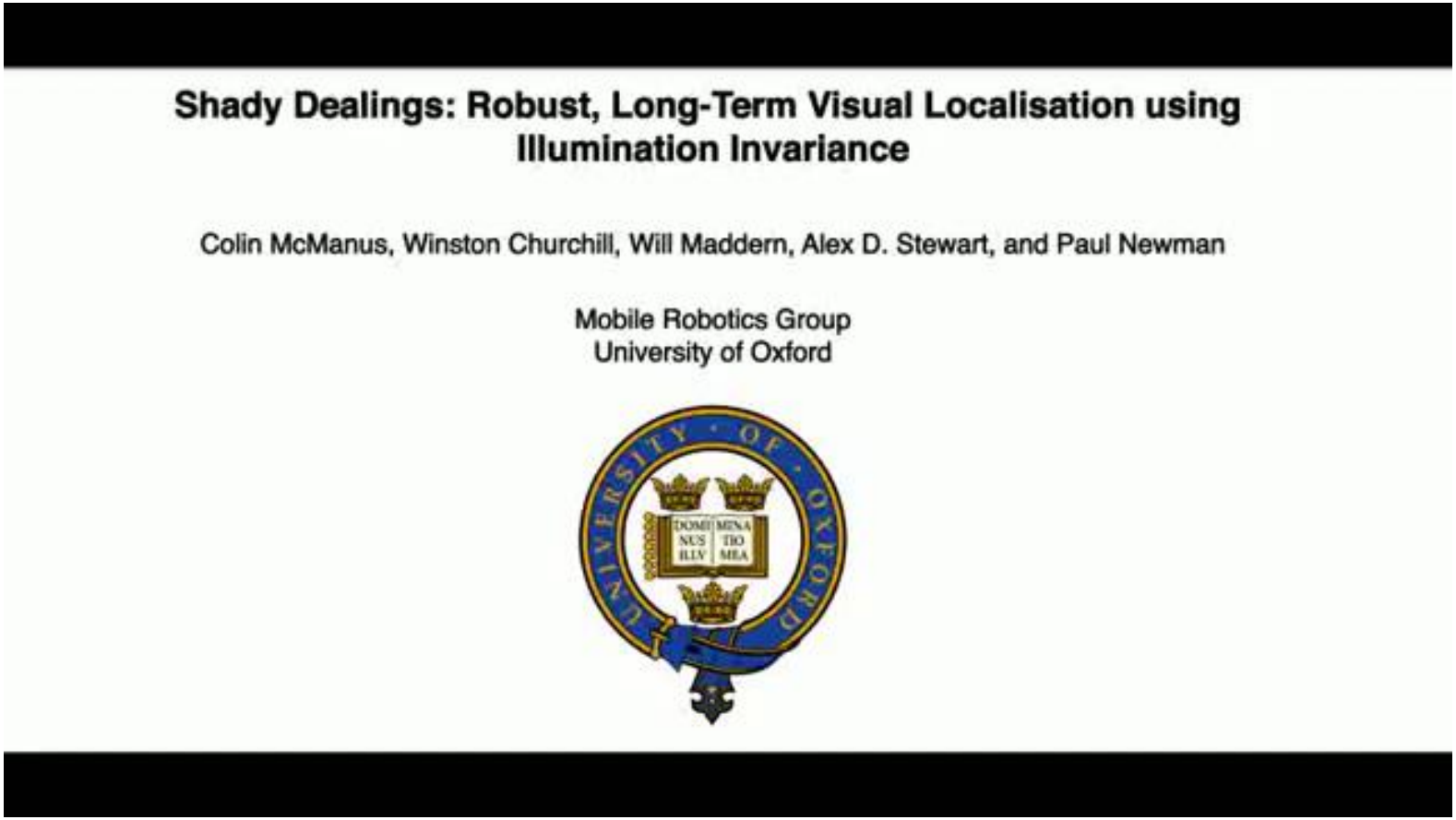
Efficiently Tracking People



"Tracking Interacting Objects Optimally Using Integer Programming"

Wang et al – CVPR14

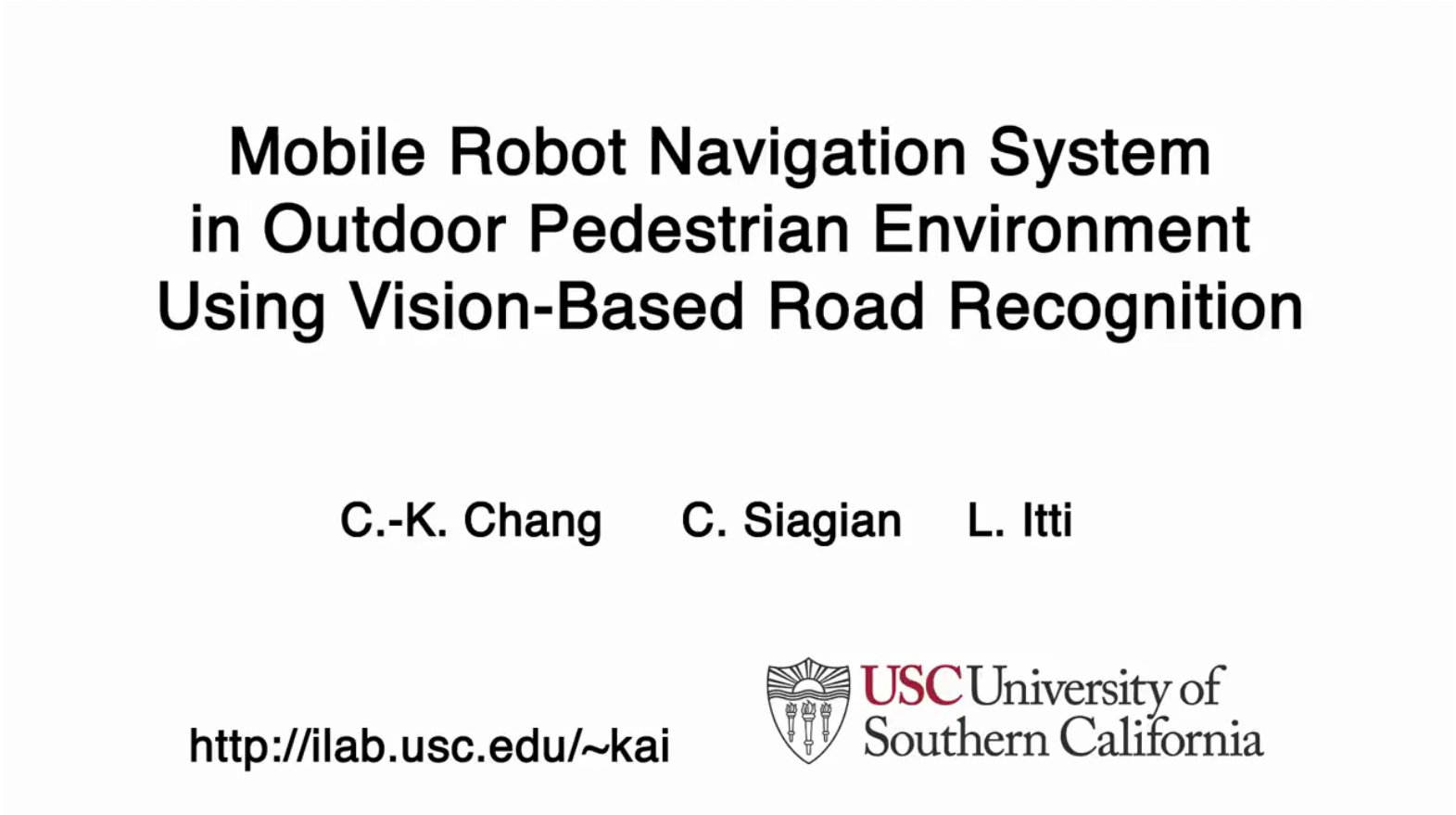
Stereo visual localisation



"Shady Dealings: Robust, Long-Term Visual Localisation using Illumination Invariance"

Colin McManus et al – ICRA14

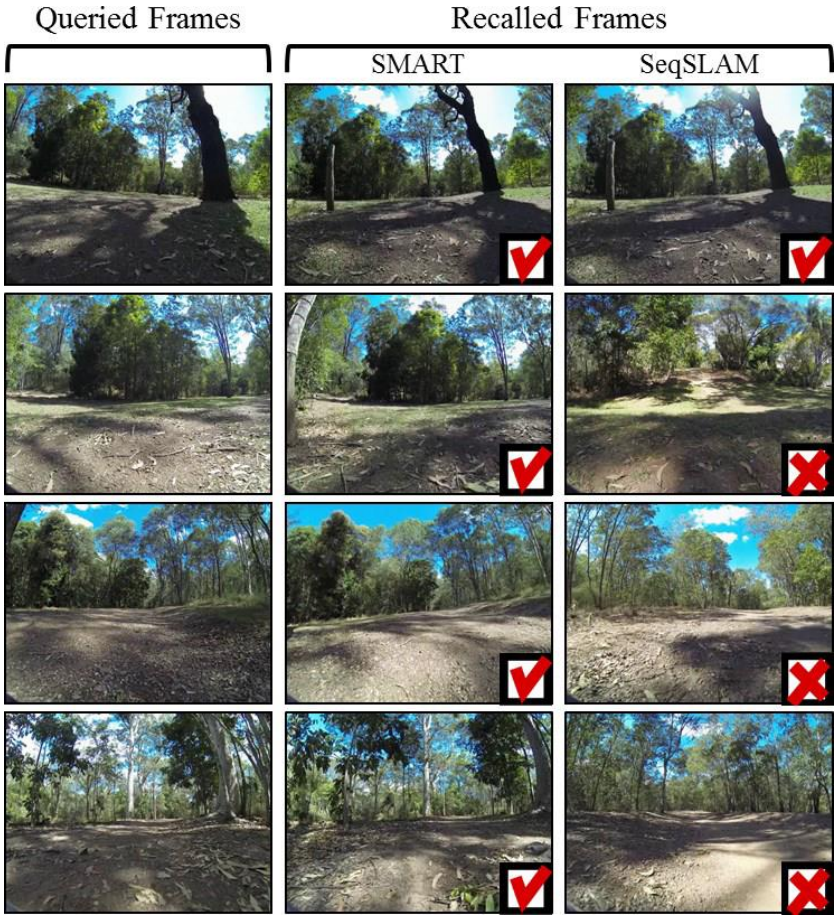
Vision-based road recognition



"Mobile Robot Navigation System in Outdoor Pedestrian Environment using Vision-Based Road Recognition"

Christian Siagian et al – ICRA13

Visual Place Recognition



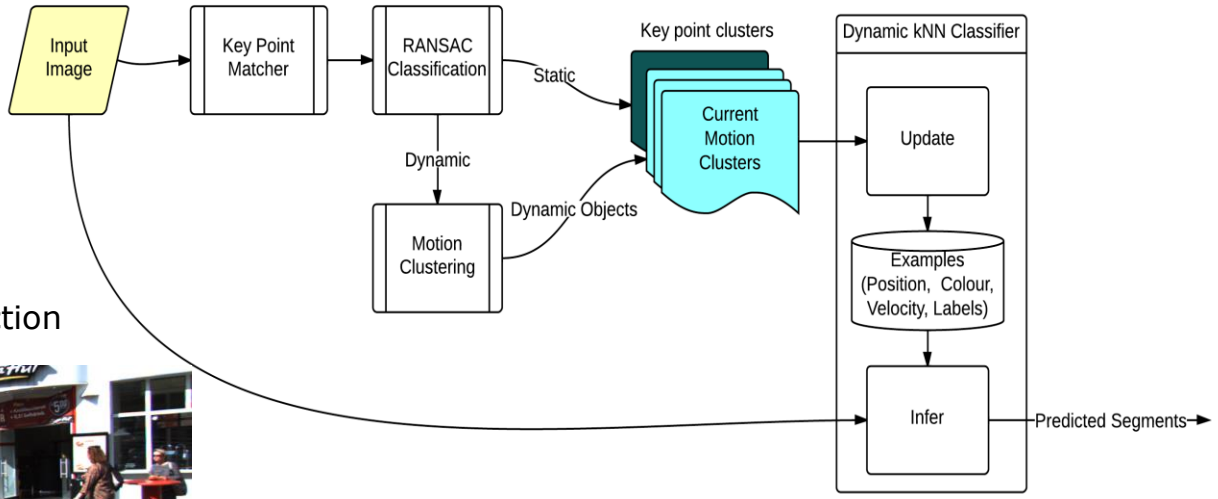
Datasets: road and off-road

"All-Environment Visual Place Recognition with SMART"

Pepperell, Corke, Milford– ICRA14

Dynamic Objects Segmentation

Object Extraction and Learning process



Multiple dynamic objects detection

"Online Self-Supervised Multi-Instance Segmentation of Dynamic Objects"

Bewley, Guizilin, Ramos, Upcroft – ICRA14

Decision time

- Score 1 to 4 each paper
- Provide email address
- Wait for optimal assignment ☺